Word count: 5,394 (excluding references)

Identifying Perinatal Anxiety

Susan Ayers, Rose Coates and Stephen Matthey

Corresponding author:

Professor Susan Ayers, Centre for Maternal and Child Health, City University London, 20 Bartholomew Close, London, EC1A 7QN

Tel: 0044 (0)207 040 5834. Email: Susan.Ayers.1@city.ac.uk

Abstract

The importance of anxiety in the health of women and their children means the issue of how to measure anxiety during pregnancy and after birth is critical. Anxiety has been conceptualised in different ways in perinatal research, including pregnancy-specific anxiety, anxiety symptoms, as well as the full range of anxiety disorders. In this chapter we look at why it is important to identify perinatal anxiety and whether diagnostic criteria are relevant to women during this time. We then consider general issues and provisos we need to be aware of when measuring and screening for perinatal anxiety. In the final section we briefly outline different measures of anxiety disorders, symptoms, and pregnancy-specific anxiety. However, choice of measure is highly dependent on the purpose and context in which it is to be used. More research is needed to validate measures for use with perinatal women and provide normative data. Measurement of anxiety in men during this time is also important and needs addressing.

Keywords: Anxiety; Screening; Pregnancy; Antenatal; Postnatal; Postpartum; Birth; Anxiety symptoms; Anxiety disorders

The importance of anxiety in the health of women and their children means the issue of how we measure anxiety during pregnancy and after birth is critical, although not without controversy. Anxiety is broadly defined as *"an emotion characterized by feelings of tension, worried thoughts and physical changes like increased blood pressure"* (American Psychiatric Association 2013). Symptoms include affective, cognitive and behavioural components. Diagnostic categories for anxiety disorders are varied and encompass generalised anxiety disorder, phobias, panic disorder, agoraphobia, social anxiety disorder, separation anxiety disorder, selective mutism, and post-traumatic stress disorder before its reclassification as a trauma and stressor related disorder (DSM-5; American Psychiatric Association 2013). Different ways of conceptualising anxiety are reflected in perinatal research which has examined worries about pregnancy through to state symptoms through to diagnostic disorders. In this chapter we first look at why it is important to identify perinatal anxiety and whether diagnostic criteria are relevant to women during this time as well as general issues and provisos when screening for perinatal anxiety. The final section briefly outlines some questionnaire measures of anxiety symptoms and pregnancy-specific anxiety.

Why is it important to identify perinatal anxiety?

There is increasing evidence that anxiety disorders and sub-threshold symptoms negatively affect not only women's well-being but also the child's development. In addition, anxiety disorders before and during pregnancy predict postnatal anxiety and depression (Sutter-Dallay et al. 2004; Matthey et al. 2003; Mauri et al. 2010; Milgrom et al. 2008). For example, anxiety in late pregnancy is associated with a more than three-fold risk of depression six to eight weeks postpartum (Austin et al. 2007;

Milgrom et al. 2008). The relationship of antenatal anxiety with postnatal psychological disorders highlights the potential for antenatal screening to identify women who will continue to experience postnatal emotional difficulties. Even women who have symptoms of anxiety in pregnancy but do not fulfil diagnostic criteria are likely to report greater postnatal depressive symptoms (Skouteris et al. 2009). Screening for high levels of anxiety in pregnant or postpartum women is therefore important in its own right and enables targeted interventions to help reduce women's distress.

Furthermore, anxiety in pregnancy is associated with poor outcomes for infants and children (see Chapter 1). Poor birth and infant outcomes, such as complications in labor, low birthweight, low apgar scores, and detrimental changes in fetal heart rate and motor activity are associated with anxiety in pregnancy (Teixeira et al. 1999; Field et al. 2010; Berle et al. 2005; DiPietro 2010; Johnson and Slade 2003). After birth, studies suggest prenatal anxiety predicts child behaviour problems from infancy through to teenage years, including attention problems, conduct disorder and emotional problems aged 4-6 (O'Connor et al. 2002; 2003); ADHD and externalizing behaviour problems aged 8-9 (Van den Bergh and Marcoen 2004); high impulsivity and low scores on cognitive tests aged 14-15 (Van den Bergh et al. 2005). Similarly, anxiety after birth is associated with emotional and conduct problems and increased somatic symptoms in children (Glasheen, Richardson and Fabio 2010). Helping women who have high levels of anxiety during their pregnancy is therefore important for both women and their developing infant.

Much of the research on the impact of anxiety relies on self-report measures of anxiety *symptoms* as opposed to structured clinical interviews assessing anxiety *disorders*. This suggests that high anxiety symptoms are clinically significant in terms

of the impact on women and their children (Glasheen, Richardson and Fabio 2010; Rucci et al. 2003). It is likely that the effects of anxiety disorders may be even more severe. However, information on the prevalence and course of anxiety over the perinatal period is mixed.

Prevalence

Use of different time points and measures of perinatal anxiety mean it is hard to draw an overall picture of the prevalence of perinatal anxiety. Large epidemiological studies of postnatal anxiety report varying prevalence rates and patterns of anxiety prevalence between pregnancy and postpartum. For example, a large epidemiological study of over 8,000 women in the UK reported that women's symptoms of anxiety were stable throughout pregnancy with a small drop after birth (Heron et al. 2004). In contrast, a large cohort longitudinal study of maternal mental health in Australia found an increase in anxiety after birth with 7.3% of women experiencing intense anxiety or panic attacks occasionally or often during pregnancy, increasing to 15.7% in the first three months postpartum (Woolhouse et al. 2009).

In terms of anxiety disorders, research using structured clinical interviews suggests generalized anxiety disorder (GAD) is most common and experienced by between 1.9 and 8.2% of women six to eight weeks postpartum (Ballard et al. 1993; Matthey et al. 2003; Wenzel et al. 2005). A study of women referred for perinatal psychiatric treatment found that the most common primary diagnosis was GAD followed by major depressive episode, with a high level of comorbidity (Grigoriadis et al. 2011). Prevalence of both GAD and obsessive compulsive disorder is higher in perinatal samples than the general population (Ross and McLean 2006). The prevalence of panic disorder (1.4%, Wenzel et al. 2005) and posttraumatic stress

disorder (1.7 - 9%, Beck et al., 2011) is comparable to the general population (Ross and McLean 2006).

In addition a substantial proportion of women experience high levels of anxiety but do not fulfil all diagnostic criteria. For example, in a study where 8.2% of postpartum women had GAD a further 19.7% of women were classified as having subsyndromal GAD (Wenzel et al. 2005). This is consistent with evidence from the general population in primary care that equal if not higher numbers of people experience subsyndromal anxiety (Olfson et al. 1996; Rucci et al. 2003) with similar levels of distress, disability and poor subjective health as those who have the full disorder (Rucci et al. 2003).

Relevance of standard diagnostic criteria to perinatal women

Given the prevalence of sub-threshold anxiety symptoms in the perinatal population, using diagnostic criteria for women in the perinatal period has been questioned (Matthey and Ross-Hamid 2011, Martini et al. 2010). Diagnostic criteria have been considered by some to be artificial constructs which not everyone with clinically significant anxiety will conform to (Matthey and Ross-Hamid, 2011; van Praag 1998; Liebowitz 1993). In addition, diagnostic criteria may not account for perinatal-specific problems. For example, Phillips et al. (2009) found that just as many women in their sample were diagnosed with 'anxiety disorder not otherwise specified' as those with Generalised Anxiety Disorder. Whilst 'anxiety disorder not otherwise specified' is still a disorder, this highlights how anxiety disorders might not be well-specified for postnatal women. Most women in this category experienced uncontrollable worry about motherhood or their infant.

Thus there may be perinatal-specific problems which are not covered by standard psychiatric classifications, such as a maternally focussed worry disorder (Phillips et al. 2009), severe fear of childbirth (tocophobia : Hofberg & Brockington 2000) or bonding disorders (Klier 2006). Focusing on specific perinatal problems may enable better prediction of outcomes and more appropriate targeting of primary and secondary interventions. For example, pregnancy-specific anxiety has been shown to be a better predictor of poor birth and developmental outcomes than general anxiety (Buss et al. 2010; DiPietro et al. 2002; Huizink et al. 2003; Roesch et al. 2004; Wadhwa et al. 1993).

A final concern that has been raised is that perinatal symptoms and issues common among new mothers, such as sleep deprivation, can inflate diagnostic symptoms and be misinterpreted as pathological. For example, symptoms of GAD include feeling tired and having difficulty sleeping which is common for women looking after a new baby. Similarly, somatic symptoms in pregnancy can overlap with anxiety symptoms such as palpitations, numbness, and sweaty hands. Rates of anxiety disorders, particularly GAD, may therefore be over-estimated if using diagnostic criteria (Matthey and Ross-Hamid 2011). Conversely, such symptoms may be discounted as part of the common experience of being pregnant, resulting in under-diagnosis. Skilled clinicians therefore need to try to disentangle symptoms of mental health problems from non-pathological aspects of pregnancy and the postpartum.

The relevance, or not, of standard diagnostic criteria to perinatal anxiety raises important issues about using diagnostic criteria as the gold standard against which to determine cut-off scores or criteria for probable anxiety. Therefore it may be useful to develop and use other approaches in combination with standard diagnostic criteria. One alternative is to use normative data for self-report anxiety measures to identify

the top percentile of women with extreme anxiety. Which percentile is used needs further examination and could be based on different criteria such as expected prevalence of clinically significant anxiety or women's need for treatment. For example, if we expect 15% of women to have clinically significant anxiety we would use the 85% percentile to determine the appropriate cut-offs. In order to use this approach normative data need to be available on each measure for pregnancy.

These issues raise questions over whether provision of treatment should be based only on diagnostic criteria and a full psychosocial assessment is recommended (see Chapter X).

Issues to consider when measuring perinatal anxiety

The issue of measurement validity and lack of a gold standard is only one of a number of issues to consider when measuring anxiety during pregnancy and after birth. Other critical issues include the purpose of measurement, timing of measure, whether we are measuring transient or enduring anxiety, and the conceptual overlap between anxiety and general measures of distress. These issues are considered in turn below.

Purpose of measurement

The first issue to consider when contemplating measuring perinatal anxiety is the purpose of the measurement and the context in which it is being done. In a clinical context the purpose of measurement is usually to identify women who require help or treatment. The focus at this stage is usually on detecting whether a woman is having difficulties with anxiety or psychological problems for which she would like help. Further detailed assessment can then ascertain the more precise nature of her difficulties and work out which referral or treatment is most appropriate. Diagnosis

does not necessarily need to be a part of this process but, if it is, would usually occur after initial assessment.

In a research context, anxiety is commonly measured to examine the relationship between symptoms of anxiety and other outcomes, or to report rates of women scoring 'high', or who are 'probably anxious'. Use of different measures and cut-off scores means rates of anxiety reported in different studies are often not comparable.

Transient versus enduring anxiety

Whether screening is used in clinical or research contexts, current evidence suggests that anxiety should be measured at least twice over a period of a few weeks to distinguish between transient and enduring distress (Ballestrem et al. 2005; Matthey and Ross-Hamid 2012; Wickberg and Hwang 1996). . Diagnosing women on the basis of a state measure of anxiety taken at one time point could result in many women being identified as anxious when this is not the case (i.e. false positives) as it is common to have a few anxious days which are not representative of general mood. Empirical studies have shown that such transient mood difficulties are common in the perinatal period. For example, studies of postnatal depression indicate that more than half of women who score as having 'probable depression' on the EPDS do not have ongoing mood difficulties (Ballestrem et al. 2005; Wickberg and Hwang 1996). There is evidence this is also true for anxiety in pregnancy, with Matthey and Ross-Hamid (2012) showing that around 50% of women scoring 'high' on anxiety (or depression) measures are no longer highly anxious (or depressed) two weeks later.

Thus whether screening for anxiety or depression the distinction should always be made between transient and enduring symptoms. In the clinical context,

questions such as *"why do you think you're feeling this way?"* and *"how do you think you may be feeling in 2 weeks or so?"* can be asked in the context of a broader psychosocial assessment (see Chapter 9 of this book). Ignoring these questions and referring all 'high scorers' to specialist health services, or reporting rates of women with 'high anxiety' based upon single administration of an anxiety scale, may pathologise transient symptoms. A consequence of this is that healthcare resources may not be used efficiently.

Timing of screening

Another difficult issue is when to screen for anxiety. Screening in pregnancy has the potential to identify women who are at risk of worse birth outcomes and postpartum psychological problems. This in turn would enable early intervention in pregnancy. However, the issue of transient anxiety is particularly pertinent. There is some consensus that during pregnancy anxiety is higher in the first and third trimesters (eg. Da Costa et al. 1999; Fertl et al. 2009; Figueiredo and Conde 2011). In the second trimester anxiety may be lower because normal stressors are likely to have dissipated, such as morning sickness, initial concern over the baby's development, and adjusting to the realisation of being pregnant. In the third trimester, anxiety might increase as a result of increasing physical limitations and the prospect of labor and birth. However, there is substantial variation across women (Heron et al. 2004). For example, a woman who has had a previous late-miscarriage or stillbirth is likely to continue to be highly anxious throughout pregnancy.

Screening for postnatal anxiety and depression in the UK has traditionally been done at 10-14 days, six to eight weeks postpartum which coincides with visits from healthcare professionals and health reviews for the new baby (Department of

Health, 2009).. On the one hand, this is a time when women may have recovered physically from the birth and got used to coping with the new baby so ratings may be a better indication of enduring anxiety. On the other hand this may be a time when support from family, partners and healthcare professionals is reduced and women may become anxious about being the sole carer of the child for much of the time. As with pregnancy, there is also considerable variability across women with respect to when and why they may feel highly anxious after birth suggesting a need for further research.

It is therefore likely that given current evidence there is no 'absolutely best' time to screen for anxiety in pregnancy or after birth. Rather, we need to be mindful of normal, potentially transient changes in anxiety. The following factors can be used as a guide for when to screen for anxiety: (i) from a pragmatic perspective it is easier to screen at a time when most women are in contact with health services; (ii) screening early in pregnancy is preferable if the aim is to intervene to reduce levels of anxiety; (iii) repeat testing is advisable of women scoring in the 'highly anxious or distressed' range. This latter point can be facilitated by brief screening tools of one or two questions that can be used at antenatal and postnatal visits. This is examined in the next section.

Diagnostic interviews to assess anxiety

The current 'gold standard' of measuring mental health problems in the perinatal period is to use clinical diagnostic interviews based on DSM or ICD criteria for the relevant disorder. Diagnosis takes place via use of a diagnostic interview with a practitioner trained in using the interview. Diagnostic interviews can be semi- or

highly-structured. This section briefly outlines some of the diagnostic interviews commonly used in perinatal research and practice.

Structured Clinical Interview for DSM-IV diagnosis (SCID-I)

The SCID-I (First et al. 2002) is a semi-structured interview for current and lifetime history of DSM-IV disorders. Screening questions relating to current and lifetime experience of the individual anxiety disorders are asked and women responding positively can then be interviewed using the relevant section(s) of the anxiety disorders module. In some studies GAD duration criteria have been altered to identify generalized anxiety since childbirth (rather than the 6 months duration criterion usually used; Matthey et al 2003, Wenzel et al. 2005).

Mini International Neuropsychiatric Interview (MINI)

The MINI (Sheehan et al. 1998) was designed to be compatible with international diagnostic criteria to diagnose common mental health disorders and to be considerably shorter (approximately 15 minutes administration time) than other diagnostic interviews. It has shown reliability and established validity when compared to the SCID and expert professional opinion (Sheehan et al. 1998). It can be administered by lay interviewers who have undergone training as well as trained mental health professionals. The MINI can detect lifetime and current mania and panic disorder and current agoraphobia, social phobia, specific phobia, obsessive-compulsive disorder, generalized anxiety disorder and posttraumatic stress disorder. "Current" is defined as "in the past month" for all diagnoses except generalized anxiety disorder, which has a six-month time frame.

The Composite International Diagnostic Interview (CIDI)

Robins et al (1988) devised the CIDI primarily for use in epidemiological studies across different cultures and settings but it is widely used in clinics and for research. Symptom questions, clinical probe questions and time-related questions of first and last occurrence of a syndrome or diagnosis are highly standardized resulting in a high level of consistency of symptom assessment and reliability of diagnostic decisions (Wittchen, 1993). The CIDI has highly detailed instructions allowing non-clinicians to use it reliably after a period of comprehensive training in a World Health Organization designated centre (Wittchen, 1993). Symptom questions assess mental disorders according to definitions and criteria of both the DSM and the ICD. Modules assessing anxiety disorders (panic, agoraphobia, social phobia, simple phobia and generalized anxiety disorder) and posttraumatic stress disorder are available. The CIDI has shown reliable in terms of consistency between two interviewers and is time-efficient (Wittchen, 1993).

Questionnaire Measures of Anxiety

There are many questionnaire measures of anxiety – both for general anxiety symptoms and for pregnancy or postpartum-related anxiety. In this section we outline a few of the most commonly used measures with information on reliability and validity. More detailed reviews can be found elsewhere (Meades and Ayers 2011). New questionnaire measures of mental health are also being developed and evaluated in other populations (e.g. the Kessler 10 (Kessler et al., 2002) and CORE 10 (Barkham et al., 2013)). These are promising but not included here because they have not yet been widely used or evaluated with perinatal women.

State-Trait Anxiety Inventory (STAI)

The STAI (Spielberger, Gorsuch and Lushene 1970) shows acceptable reliability and has been widely validated. It is one of the most commonly used measures of anxiety symptoms (Glasheen et al. 2010). It comprises two scales each with 20 items: a state anxiety scale and a trait anxiety scale. The state scale's instructions are for the person to complete the measure indicating how he/she feels "*right* now, that is, *at this moment*" (original italics). Unfortunately this state measure has been used frequently in perinatal studies where the exact 'moment' being measured has not been standardised or controlled, thus making any findings questionable. For example, Aktan (2012) reports having participants complete the STAI-S at home, and Paul et al (2013) administered the measure to participants over the phone. In both cases it is not possible to know what was happening for the women at the moment when they completed the scale – some may have been stressed if, for example, they had just had an argument; while others may have been more relaxed due to circumstances at that time.

In addition, items such as 'I feel comfortable' and 'I am relaxed' may be affected by the normal sequelae of the physical changes during pregnancy, such as becoming larger (and thus feeling uncomfortable, and not relaxed). Given the requirement for women to complete the items for how she is feeling "*right* now", it is likely that for some women this will detect transient anxiety, much of which could be normal (eg., concern over the health of the baby), and not just enduring anxiety. The State version should therefore only be used when assessing anxiety in a specific situation (e.g. just before an ultrasound scan) that can be standardised across all the participants. And consideration should be given to items that could be affected by normal physical changes of pregnancy (or the postpartum).

The trait subscale measures a more general or enduring individual tendency to react with heightened anxiety. Symptoms are endorsed on a four-point scale (1-4), thus the maximum score on one scale is 80. Examples of items are 'I am a steady person' and 'I lack self-confidence'. Both scales correlate highly with measures of depression (Stuart et al. 1998). A shorter 6 item scale has been developed and validated for use in pregnant women with correlations of greater than 0.90 between the original and shorter version scores (Marteau and Bekker 1992).

In perinatal samples the cut-off scores used for the 20-item trait scale vary. For example, Barnett and Parker (1985) used 32 or more for 'moderate' anxiety and 45 or more for 'high' anxiety in women 3 weeks postpartum. However, Grant et al (2008) found that scoring 41 or more gave the best sensitivity, specificity and positive and negative predictive values to identify cases of anxiety in late pregnancy and was associated with a six-fold increase in postnatal anxiety disorders and depression. The trait scale also seems to be affected by anxious state in perinatal samples, as test-retest correlations range between 0.37 and 0.85 and lower scores are found after birth (Hundley et al. 1998).

Hospital Anxiety and Depression Scale – anxiety subscale (HADS-A)

The HADS (Zigmond and Snaith 1983) consists of two subscales of depression and anxiety, which each have seven items. Anxiety items are general e.g. 'I get sudden feelings of panic' and 'Worrying thoughts go through my mind'. However, a few items may be confounded by symptoms of pregnancy e.g. 'I can sit at ease and feel relaxed', 'I feel restless as if I have to be on the move'. Symptoms are endorsed on a four-point scale (0-3) over the last seven days, thus the maximum score is 21. Scores of 0-7 are considered 'normal', 8-10 suggestive of anxiety and 11 or more indicates

probable disorder (Snaith 2003). Validation of cut-offs suggests a lack of consistency. In a non-perinatal sample Bjelland et al. (2002) found a score of 8 or above gives optimal sensitivity and specificity. This has subsequently been used in three studies validating the HADS-A in pregnancy. However, this cut-off resulted in unusually high prevalence rates in UK (36-56%) and Uzbekistani (38-42%) samples (Jomeen and Martin 2004; Karimova and Martin 2003). A recent study found a cut-off score of 9 or more identified the top 15% of English-speaking women on this measure in their sample (Matthey et al. 2013b).

The HADS-A does not correlate highly with other measures of anxiety e.g. the EPDS-A (described below) indicating these measures pick up different facets of anxiety (Matthey et al. 2013b). The factor structure of the HADS is also unclear with between 2 and 5 factors being found including both depression and anxiety items (Bjelland et al. 2002; Jomeen and Martin, 2004; Karimova and Martin, 2003). However, internal reliability is usually good (Karimova and Martin, 2003). Studies validating the HADS-A in postpartum samples are scarce so further work is needed.

Edinburgh Postnatal Depression Scale - anxiety subscale (EPDS-3A)

Although not designed to detect anxiety, a review of research suggests three items on the EPDS (Cox et al. 1987) can be used to detect anxiety in perinatal women (Matthey et al. 2013a). The items are "I have blamed myself unnecessarily when things went wrong", "I have been anxious or worried for no good reason" and "I have felt scared or panicky for no very good reason". These load onto an anxiety subscale in factor analyses in ante- and postnatal populations and there is also some evidence to suggest that the subscale can distinguish anxious and depressive disorders (Matthey et al. 2013a; Bowen et al. 2008; Ross et al. 2003). However, other studies suggest separate

subscale scores may not be accurate (Reichenheim et al. 2011) and that using the usual total scale cut-off (i.e. 13 or more) might not identify all women with anxiety disorders (Matthey, 2008;. Further research examining this is therefore needed. Scores range from 0–9 for the anxiety subscale and 0–30 for the total EPDS.

Pregnancy-specific measures of anxiety

Specific measures of anxiety during pregnancy are available, although there is sometimes conceptual overlap between these and measures of pregnancy-related worries, stress and distress, which often include anxiety-type affective items. For example, a review of pregnancy stress measures identified 15 questionnaires which broadly fell into either stressor measures, emotional response measures (e.g. anxiety), and multidimensional measures (Alderdice, Lynn and Lobel 2012). Three pregnancy-specific anxiety measures are outlined briefly below.

Pregnancy-Related Anxiety Questionnaire (PRAQ)

The PRAQ (Van den Bergh 1989; Van den Burgh 1990) is the longest scale available with 55 items covering five subscales of fear of delivery (9 items), fear of bearing a handicapped child (6 items), concerns about partner relations (11 items), concerns about mood (11 items), and fear of change (8 items). Responses are rated on a Likert scale from 1 to 7 giving a possible range of 55 to 385. Internal reliability is good (van Bussel, Spitz and Demyttenaere 2009) but no other psychometric information are available. Shorter 34-item and 10-item versions have been developed using factor analysis (Gutteling et al 2006; Huizink et al. 2004; Huizink et al. 2002) with three subscales identified: fear of birth (e.g. ‘I am worried about the pain of contractions and the pain during delivery’), fear of bearing a handicapped child (e.g. ‘I am worried

that the baby will be abnormal'), and pregnancy-related concerns about one's appearance (e.g. 'I am worried about the fact that I shall not regain my figure after delivery'). The shorter versions of the PRAQ are associated with perceived stress, hassles, and alcohol use in pregnancy (Arch 2012; Gutteling et al. 2006; Huizink et al. 2004; Huizink et al. 2002).

Pregnancy Anxiety Scale (PAS)

The PAS (Levin 1991) is a brief and retrospective questionnaire of 10 items that measure anxiety about being pregnant (3 items, e.g. 'did you fear that you would fall and hurt your baby?'), giving birth (4 items, e.g. 'were you afraid the pain of childbirth would be bad?') or being in hospital (3 items, e.g. 'were you afraid you would be alone the hospital?'). Responses are true/false giving a possible range of 0 to 10. The scale was extracted from 25 items using confirmatory factor analysis (Levin 1991). Although the scale has been used in a few subsequent studies (e.g. Poikkeus et al 2006) very little other information on reliability and validity is available. There is also no information on cut-offs or the point at which anxiety becomes clinically meaningful.

Pregnancy-Specific Anxiety Scale (PSAS)

The PSAS (Roesch et al. 2004) is a very short 4-item questionnaire which was extracted from a larger pool of items using factor analysis. Items are similar to the STAI in that they ask how often women have felt anxious, concerned, afraid, and panicky in the last week, but in the context of pregnancy. Responses are scored from 1 to 5, giving a possible range of 4 to 20. The PSAS has been used in various studies with inconsistent results. For example, it has been associated with shorter gestation

(Roesch et al. 2004) and preterm birth (Kramer et al. 2009) but this was not replicated in a sample of African American women (Dominguez et al. 2005). Internal reliability is also low in some instances (Roesch et al. 2004).

Whether to measure anxiety or general distress

One further that arises when measuring perinatal anxiety is whether it more appropriate to use a specific measure of anxiety or a measure of general distress. This is likely to vary according to the purpose and context in which screening is being done. For research, a specific measure of anxiety with good criterion validity is essential if we are to understand the causes and consequences of perinatal anxiety further. However, in the clinical context it may be useful to use one or two general questions to get a quick screen for any perinatal distress, regardless of whether it is 'anxiety', 'stress', or 'depression' as a guide for later follow-up. Such questions are currently available but further research is required to ascertain their sensitivity and specificity so that the clinician can have confidence in their use. Two examples are the Whooley questions for depression (Whooley 1997) which are used by UK health services to screen for depression in pregnancy and after birth; and the Matthey Generic Mood Questions in Box 1 which have been developed and piloted in Australia (MGMQ; Matthey et al. 2013b).

Box 1. The Matthey Generic Mood Question (MGMQ) (cf. Matthey et al. 2013b)

Q.1a	In the last 2 weeks have you felt very stressed, anxious or unhappy, or found it difficult to cope*, for some of the time?	Yes *(go to Q.1b)* Possibly *(go to Q.1b)* No
Q.1b	How bothered have you been by these feelings?	Not at all A little bit Moderately *(go to Q.1c)* A lot *(go to Q.1c)*
Q.1c	Is there anything in particular that is making you feel this way?	*Describe:*

***The author is investigating the inclusion of the word 'manage' to this question.**

Conclusion and recommendations

In summary, anxiety symptoms are common in pregnancy and after birth and some disorders, such as GAD, are more prevalent than normal during this time. However, diagnostic criteria may be confounded by normal symptoms of pregnancy and postpartum and not recognise perinatal-specific problems, such as fear of birth or worries about the baby. There is also evidence that those who do not fulfil diagnostic criteria but have sub-syndromal symptoms may report similar levels of distress, disability and poor subjective health.

Issues that need to be considered before screening for anxiety include considering what we are screening for, when the best time is to screen, and to ensure screening is not confounded by normal fluctuations in anxiety during pregnancy and after birth. In terms of screening tools, a range of general anxiety and pregnancy-specific anxiety questionnaires are available, with varying reliability and validity. Questionnaires vary in the symptoms they focus on and therefore concordance between them can be poor. There is also often conceptual overlap with measures of stress, distress and worry. Where cut-offs are available these are usually determined by comparison with diagnostic criteria.

On the basis of the evidence covered here we can make a number of recommendations. The first is that anxiety screening needs to be repeated to avoid over-pathologising transient distress. Secondly, in clinical contexts it may be useful to use a 2-stage process where brief screening questions are used to identify women with *any* emotional distress who may benefit from more detailed assessment at a subsequent stage, although further research evaluating this approach is needed. Finally, there are a number of anxiety questionnaires available that have different strengths and weaknesses. Choice of measure will be highly dependent on the purpose and context in which it is to be used. The STAI has been most validated and may useful in research as a specific measure of anxiety. The HADS-A has shown good reliability in pregnancy. New measures are also being developed which appear promising (eg. Kessler-10). However, more research is needed on the validity of different measures in perinatal women and to provide normative data for measures at different time points so appropriate cut-offs can be identified. Similarly, research needs to examine men's anxiety during this time and consider respective measurement issues.

References

Abiodun, O.A. 1994. "A validity study of the Hospital Anxiety and Depression Scale in General Hospital Units and a community sample in Nigeria." *British Journal of Psychiatry,* 165: 669-672.

Aktan, N.M. 2012. "Social support and anxiety in pregnant and postpartum women: a secondary analysis." *Clinical Nursing Research,* 21: 183-194.

Alderdice, Fiona, Fiona Lynn, and Marci Lobel. 2012. "A review and psychometric evaluation of pregnancy-specific stress measures." *Journal of Psychosomatic Obstetrics & Gynecology,* 33(2): 62–77. doi: 0.3109/0167482X.2012.673040.

American Psychiatric Association. 2013. *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: American Psychiatric Publishing.

Arch, Joanna J. 2013. "Pregnancy-specific anxiety: which women are highest and what are the alcohol-related risks?" *Comprehensive Psychiatry,* 54(3): 217-28.

Austin, Marie-Paule, Lucy Tully and Gordon Parker. 2007. "Examining the relationship between antenatal anxiety and postnatal depression." *Journal of Affective Disorders,* 101(1-3): 169-174.

Ballard, Clive G, Robert E Davis, Sumi Handy and Rajesh M C Mohan. 1993. "Postpartum anxiety in mothers and fathers." *European Journal of Psychiatry,* 7: 117-121.

Barnett, Bryanne and Gordon Parker. 1985. "Professional and non-professional intervention for highly anxious primiparous mothers." *British Journal of Psychiatry,* 146: 287-293.

Beck, Cheryl T, Robert K Gable, Carol Sakala and Eugene R Declercq. 2011. "Posttraumatic stress disorder in new mothers: Results from a two-stage U.S. National Survey." *Birth,* 38(3): 216-227.

Berle, Jan O, Arnstein Mykletun, Anna K Daltveit, Svein A Rasmussen, Fred Holsten, and Alv A Dahl. 2005. ”Neonatal outcomes in offspring of women with anxiety and depression during pregnancy. A linkage study from the Nord-Trondelag Health Study (HUNT) and Medical Birth Registry of Norway.” *Archives of Women's Mental Health*, 8: 181-189.

Bjelland, Ingvar, Alv A Dahl, Tone T Haug and Dag Neckelmann. 2002. “The validity of the Hospital Anxiety and Depression Scale; an updated review.” *Journal of Psychosomatic Research,* 52: 69-77.

Bowen, A., R Bowen, G Maslany, N Muhajarina. 2008. “Anxiety in a socially-high-risk sample of pregnant women in Canada.” *Canadian Journal of Psychiatry,* 53: 435-440

Buss, Claudia, Elysia P Davis, L. Tugan Muftuler, Kevin Head and Curt A Sandman. 2010. “High pregnancy anxiety during mid-gestation is associated with decreased gray matter density in 6-9-year-old children.” *Psychoneuroendocrinology*, 35(1): 141-153.

Cox, John L, Jeni M C Holden, R Sagovsky. 1987. “Detection of postnatal depression: development of the 10-item Edinburgh Postnatal Depression scale.” *British Journal of Psychiatry,* 150: 782-786

Department of Health. 2009. *The Healthy Child Programme – Pregnancy and the first five years of life.* Available at (https://www.gov.uk/government/publications/healthy-child-programme-pregnancy-and-the-first-5-years-of-life)

DiPietro, Janet A. 2010. “Psychological and psychophysiological considerations regarding the maternal-fetal relationship.” *Infant and Child Development*, 19: 27-38.

DiPietro, Janet A, Sterling C Hilton, Melissa Hawkins, Kathleen A Costigan and Eva K Pressman. 2002. "Maternal stress and affect influence fetal neurobehavioral development." *Developmental Psychology*, 38(5): 659-668.

Dominguez, Tyan P, Christine D Schetter, Robert A Mancuso, Christine M Rini and Calvin J Hobel. 2005. "Stress in African American pregnancies: testing the roles of various stress concepts in prediction of birth outcomes." *Annals of Behavioral Medicine,* 29: 12–21.

Field, Tiffany A, Miguel Diego, Maria Hernandez-Reif, Barbara Figueiredo, Osvelia Deeds, Angela Ascencio, Saul M Schanberg and Cynthia Kuhn. 2010. "Comorbid depression and anxiety effects on pregnancy and neonatal outcome." *Infant Behavior and Development*, 33: 23-29.

First, M.B., M Gibbon, RL Spitzer, JW Williams. 2002. "Users guide to the structured clinical interview for DSM-IV-TR axis I disorders – research version –(SCID-I for DSM-IV-TR, November 2002 revision). Biometrics Research Department, New York State Psychiatric Institute, New York.

Glasheen, Cristie, Gale A Richardson and Anthony Fabio. 2010. "A systematic review of the effects of postnatal maternal anxiety on children." *Archives of Women's Mental Health,* 13: 61-74.

Grant, Kerry-Ann, Catherine McMahon and Marie-Paule Austin. 2008. "Maternal anxiety during the transition to parenthood: A prospective study." *Journal of Affective Disorders,* 108: 101-111.

Grigoriadis, Sophie, Diane De Camps Meschino, Elaine Barrons, Lana S Bradley, Allison Eady, Alicja Fishell, Lana Mamisachvili, Greer S Cook, Maura O'Keefe, Sarah E Romans, Lori E Ross. 2011. "Mood and anxiety disorders in

a sample of Canadian perinatal women referred for psychiatric care." *Archives of Women's Mental Health*, 14 (4): 325-333.

Gutteling, Barbara M, Carolina de Weerth, Noortje Zandbelt, Eduard J H Mulder, Gerard H A Visser, Jan K Buitelaar. 2006. "Does maternal prenatal stress adversely affect the child's learning and memory at age six?" *Journal of Abnormal Child Psychology*, 34: 789–798.

Heron, Jonathan, Thomas G O'Connor, Jonathan Evans, Jean Golding, Vivette Glover and the ALSPAC Study Team. 2004. "The course of anxiety and depression through pregnancy and the postpartum in a community sample." *Journal of Affective Disorders*, 80: 65-73.

Hofberg, Kristina R and Ian Brockington. 2000. "Tokophobia: an unreasoning dread of childbirth. A series of 26 cases." *British Journal of Psychiatry*, 176: 83-85.

Huizink, Anja C, Pascale G Robles De Medina, Eduard J H Mulder, Gerard H A Visser and Jan K Buitelaar. 2003. "Stress during pregnancy is associated with developmental outcome in infancy." *Journal of Child Psychology and Psychiatry and Allied Disciplines*, 44(6): 810-818.

Huizink, Anja C, Eduard J H Mulder, Pascale G Robles de Medina, Gerard H A Visser and Jan K Buitelaar. 2004. "Is pregnancy anxiety a distinctive syndrome?" *Early Human Development*, 79: 81–91.

Huizink, Anja C, Pascale G Robles de Medina, Eduard J H Mulder, Gerard H A Visser and Jan K Buitelaar. 2002. "Psychological measures of prenatal stress as predictors of infant temperament." *Journal of the American Academy of Child and Adolescent Psychiatry*, 41: 1078–1085.

Hundley, Vanora A, Elaine Gurney, Wendy J Graham and Anne M Rennie. 1998. "Can anxiety in pregnant women be measured using the State-Trait Anxiety Inventory?" *Midwifery*, 14: 118-121.

Johnson, R C and Pauline D Slade. 2003. "Obstetric complications and anxiety during pregnancy: Is there a relationship?" *Journal of Psychosomatic Obstetrics and Gynecology*, 24: 1-14.

Jomeen, Julie and Colin R Martin. 2005. "Confirmation of an occluded anxiety component within the Edinburgh Postnatal Depression Scale (EPDS) during pregnancy." *Journal of Reproductive and Infant Psychology*, 23: 143-154.

Karimova, Gulia K and Colin R Martin. 2003. "A psychometric evaluation of the Hospital Anxiety and Depression Scale during pregnancy." *Psychology, Health and Medicine*, 8: 89-103.

Kessler, R.C., Andrews, G., Colpe, L.J., Hiripi, E., Mroczek, D.K., Normand, S.-L., Walters, E.E., Zaslavsky, A.M., 2002. Short screening scales to monitor population prevalences and trends in non-specific psychological distress. *Psychological Medicine*, 32, 959–976.

Klier, Claudia M. 2006. "Mother-infant bonding disorders in patients with postnatal depression: The Postpartum Bonding Questionnaire in clinical practice." *Archives of Women's Mental Health*, 9(5): 289-91.

Kramer, Michael S, John Lydon, Louise Seguin, Lise Goulet, Susan R Kahn, Helen McNamara, Jacques Genest, et al. 2009. "Stress pathways to spontaneous preterm birth: the role of stressors, psychological distress, and stress hormones." *American Journal of Epidemiology, 169*, 1319–1326.

Levin, Jeff S. 1991. "The factor structure of the Pregnancy Anxiety Scale." *Journal of Health and Social Behavior*, 32: 368–381.

Liebowitz, Michael R. 1993. "Mixed anxiety and depression: Should it be included in DSM-IV?" *Journal of Clinical Psychiatry, 54* (5 SUPPL.): 4-7.

Marteau, Theresa M and Hilary L Bekker. 1992. "The development of a six-item short form of the state scale of the Spielberger State-Trait Anxiety Inventory (STAI)." *British Journal of Clinical Psychology*, 31: 301-306.

Martini, Julia, Susanne Knappe, Katja Beesdo-Baum, Roselind Lieb and Hans-Ulrich Wittchen. 2010. "Anxiety disorders before birth and self-perceived distress during pregnancy: Associations with maternal depression and obstetric, neonatal and early childhood outcomes." *Early Human Development*, 86 (5): 305-310.

Matthey, Stephen. 2008. "Using the Edinburgh Postnatal Depression Scale to screen for anxiety disorders." *Depression and Anxiety*, 25(11): 926-931.

Matthey, Stephen and Clodagh Ross-Hamid. 2011. "The validity of DSM symptoms for depression and anxiety disorders during pregnancy." *Journal of Affective Disorders*, 133 (3): 546-552.

Matthey, Stephen and Clodagh Ross-Hamid. 2012. "Repeat testing on the Edinburgh Depression Scale and the HADS-A in pregnancy: differentiating between transient and enduring distress." *Journal of Affective Disorders*, 141: 213-221

Matthey, Stephen, Jane R W Fisher and Heather Rowe. (2013a). Using the Edinburgh Postnatal Depression Scale to screen for anxiety disorders: Conceptual and methodological considerations. *Journal of Affective Disorders*, 146: 224-230.

Matthey, Stephen, Barbara Valenti, Kay Souter and Clodagh Ross-Hamid. 2013b. "Comparison of four self-report measures and a generic mood question to screen for anxiety during pregnancy in English-speaking women." *Journal of Affective Disorders*, 148: 347-351.

Matthey, Stephen, Bryanne Barnett, Pauline M Howie, David J Kavanagh. 2003. "Diagnosing postpartum depression in mothers and fathers: whatever happened to anxiety?" *Journal of Affective Disorders,* 74: 139-147.

Mauri, Mauro, Annalisa Oppo, Maria S Montagnani, Chiara Borri, Susanna Banti, Valeria Camilleri, Sonia Cortopassi et al. 2010. "Beyond "postpartum depressions": Specific anxiety diagnoses during pregnancy predict different outcomes: Results from PND-ReScU." *Journal of Affective Disorders*, 127 (1-3): 177-184.

Meades, Rose and Susan Ayers. 2011. "Anxiety measures validated in perinatal populations: A systematic review." *Journal of Affective Disorders,* 133(1-2): 1-15**.**

Milgrom, Jeannette, Alan W Gemmill, Justin L Bilszta, Barbara Hayes, Bryanne Barnett, Janette Brooks, Jennifer Ericksen et al. 2008. "Antenatal risk factors for postnatal depression: A large prospective study." *Journal of Affective Disorders*, 108 (1-2): 147-157.

O'Connor, Thomas G, Jonathan Heron, Jean Golding, Michael Beveridge and Vivette Glover. 2002. "Maternal antenatal anxiety and children's behavioral/emotional problems at 4 years." *British Journal of Psychiatry,* 180: 502- 508.

O'Connor, Thomas G, Jonathan Heron, Jean Golding, Vivette Glover and the ALSPAC Study Team. 2003. "Maternal anxiety and behavioural/emotional problems in children: A test of a programming hypothesis." *Journal of Child Psychology and Psychiatry*, 44: 1025-1036.

Olfson, Mark, W Eugene Broadhead, Myma M Weissman, Andrew C Leon, Farber, L., Christina W Hoven and Roger G Kathol. 1996. "Subthreshold psychiatric

symptoms in a primary care group practice." *Archives of General Psychiatry*, 53: 880–886.

Paul, I.M., Downs, D.S., Schaefer, E.W., Beiler, J.S., Weisman, C.S. 2013. "Postpartum anxiety and maternal-infant health outcomes". *Pediatrics*, 131: e1218-e1224.

Phillips, Jane, Louise Sharpe, Stephen Matthey and Margaret Charles. 2009. "Maternally focussed worry." *Archives of Women's Mental Health*, 12: 409-418.

Poikkeus, Piia, Terhi Saisto, Leila Unkila-Kallio, Raija L Punamaki, Leena Repokari, Sirpa Vilska, Aila E Tiitinen et al. 2006. "Fear of childbirth and pregnancy-related anxiety in women conceiving with assisted reproduction." *Obstetrics and Gynecology*, 108(1): 70-76.

Reichenheim, ME, CL Moraes, ASD Oliveira, G Lobato. 2011. "Revisiting the dimensional structure of the Edinburgh Postnatal Depression Scale (EPDS): Empirical evidence for a general factor. *BMC Medical Research Methodology*, 11: Article number 93.

Robins, L.N., JE Helzer, J Croughan, KS Ratcliff. 1988. "The Composite International Diagnostic Interview: An epidemiological instrument suitable for use in conjunction with different diagnostic systems and in different cultures." *Archives of General Psychiatry*, 45: 1069-1077

Roesch, Scott C, Christine D Schetter, Grace Woo and Clavin J Hobel. 2004. "Modeling the types and timing of stress in pregnancy." *Anxiety, Stress and Coping*, 17(1): 87-102.

Ross, Lori E, SEG Evans, EM Sellers, MK Romach. 2003. "Measurement issues in postpartum depression 1: anxiety as a feature of postpartum depression." *Archives of Women's Mental Health,* 6: 51-57

Ross, Lori E and Linda M McLean. 2006. "Anxiety disorders during pregnancy and the postpartum period: A systematic review." *Journal of Clinical Psychiatry*, 67: 1285-1298.

Rucci, Paola, Stefano Gherardi, Michele Tansella, Marco Piccinelli, Domenico Berardi, Giulia Bisoffi, Maria A Corsino et al. 2003. "Subthreshold psychiatric disorders in primary care: Prevalence and associated characteristics." *Journal of Affective Disorders*, 76 (1-3): 171-181.

Schmied, Virginia, Maree Johnson, Norell Naidoo, Marie-Paule Austin, Stephen Matthey, Lynne Kemp, Annie Mills et al. 2013. "Maternal mental health in Australia and New Zealand: A review of longitudinal studies." *Women and Birth*, 26(3): 167-178.

Sheehan, David V, Yves Lecrubier, K. Harnett Sheehan, Patricia Amorim, Juris Janavs, Emmanuelle Weiller, Thierry Hergueta, Roxy Baker, Geoffery C Dunbar. 1998. "The Mini-International Neuropsychiatric Interview (MINI): The development and validation of a structured psychiatric interview for DSM-IV and ICD-10. *Journal of Clinical Psychiatry*, 59[Suppl 20]: 22-33.

Skouteris, Helen, Eleanor H Wertheim, Sofia Rallis, Jeanette Milgrom and Susan J Paxton. 2009. "Depression and anxiety through pregnancy and the early postpartum: An examination of prospective relationships." *Journal of Affective Disorders*, 113 (3): 303-308.

Snaith, R Phillip. 2003. “The Hospital Anxiety and Depression Scale.” *Health and Quality of Life Outcomes,* 1 (29). doi:10.1186/1477-7525-1-29 Accessed 29 July 2013.

Spielberger, Charles D, Richard L Gorsuch, and Robert E Lushene. 1970. *Manual for the State-Trait Anxiety Inventory (STAI)*. Palo Alto, CA: Consulting Psychologists Press.

Stuart, Scott, Greg Couser, Kelly Schilder, Michael O’Hara and Lori Gorman. 1998. “Postpartum anxiety and depression: Onset and comorbidity in a community sample.” *Journal of Nervous and Mental Disease,* 186: 420-424.

Sutter-Dallay, Anne L, V Giaconne-Marcesche, Elisabeth Glatigny-Dallay and Helene Verdoux. 2004. “Women with anxiety disorders during pregnancy are at increased risk of intense postnatal depressive symptoms: A prospective survey of the MATQUID cohort.” *European Psychiatry,* 19: 459-463.

Teixeira, Jeronima M A, Nicholas M Fisk and Vivette Glover. 1999. “Association between maternal anxiety in pregnancy and increased uterine artery resistance index: Cohort based study.” *British Medical Journal*, 318: 153-157

van Bussel, Johan C H, Bernard Spitz and Koen Demyttenaere. 2009. “Anxiety in pregnant and postpartum women. An exploratory study of the role of maternal orientations.” *Journal of Affective Disorders,* 114: 232–242.

van den Bergh, Bea R H. De emotionele toestand van de (zwangere) vrouw, obstretische complicaties en het gedrag en de ontwikkeling van de foetus en van het kind tot de leeftijd van zeven maanden [The emotional state of the (pregnant) woman, obstetrical complications and the behavior and development of fetus and child until seven months after birth].” (PhD diss., Universiteit Leuven, 1989).

van den Bergh, Bea R H. 1990. “The influence of maternal emotions during pregnancy on fetal and neonatal behavior.” *Journal of Prenatal and Perinatal Psychological Health,* 5: 119–130.

van den Bergh, Bea R H and Alfons Marcoen. 2004. “High antenatal maternal anxiety is related to ADHD symptoms, externalizing problems, and anxiety in 8- and 9-year-olds.” *Child Development,* 75 (4): 1085-97.

van den Bergh, Bea R H, Maarten Mennes, Jaap Oosterlaan, Veerle Stevens, Peter Stiers, Alfons Marcoen and Lieven Lagae. 2005. “High antenatal maternal anxiety is related to impulsivity during performance on cognitive tasks in 14- and 15- year olds.” *Neuroscience and Biobehavioral Reviews*, 29: 259-269.

Van Praag, Herman M, James Rodney and Gordon B Parker. 1998. “The diagnosis of depression in disorder.” *Australian and New Zealand Journal of Psychiatry*, 32 (6): 767-777.

Wadhwa, Pathik D, Curt A Sandman, Manuel Porto, Christine Dunkel-Schetter and Thomas J Garite. 1993. “The association between prenatal stress and infant birth weight and gestational age at birth: A prospective investigation.” *American Journal of Obstetrics and Gynecology,* 169 (4): 858-865.

Wenzel, Amy, Erin N Haugen, Lydia C Jackson and Jennifer R Brendle. 2005. “Anxiety symptoms and disorders at eight weeks postpartum.” *Journal of Anxiety Disorders*, 19: 295-311.

Whooley, Mary A, Andrew L Avins, Jeanne Miranda, Warren S Browner. 1997. “Case-finding instruments for depression: Two questions are as good as many.” *Journal of General Internal Medicine,* 12: 439-445.

Wittchen, Hans-Ulrich. 1993. “Reliability and validity studies of the WHO-Composite International Diagnostic Interview (CIDI): A critical review.” *Journal of Psychiatric Research,* 28: 57-84

Woolhouse, Hannah, Stephanie Brown, Ann Krastev, Susan Perlen and Jane Gunn. 2009. “Seeking help for anxiety and depression after childbirth: results of the Maternal Health Study.” *Archives of Women’s Mental Health,* 12 2: 75-78 DOI

Zigmond, Anthony S and R Phillip Snaith. 1983. “The hospital anxiety and depression scale.” *Acta Psychiatrica Scandinavica*, 67: 361-370.

Biographical notes

Susan Ayers is a professor in the Centre for Maternal and Child Health Research at City University London, and visiting professor at the University of Sussex, UK. Susan's research focuses on women's psychological wellbeing and mental health during pregnancy and after birth. Susan is an author of *Psychology for Medicine (2011)* and editor of the Cambridge *Handbook of Psychology, Health and Medicine, 2nd Ed. (2007).* She was awarded the Annual Lecturer Prize by the Society of Reproductive and Infant Psychology in 2012.

Rose Coates is a doctoral researcher in the School of Psychology, University of Sussex, UK. Her research is on optimal ways of conceptualising and screening for postnatal psychological distress such as anxiety, depression and post-traumatic stress following birth. She has published on anxiety measurement, symptoms of perinatal distress, and intervention.

Associate Professor Stephen Matthey is a senior clinical psychologist and researcher in the Department of Health in NSW, Australia. He is also an adjunct Associate Professor in the School of Psychology, University of Sydney, Australia (but note: I'm English!). He has published around 100 papers in peer-reviewed journals on a range of topics, including: child and adult treatment; educational psychology; cross-cultural psychology; perinatal mental health; psychological assessment; questionnaire development; statistics; brain injury; fathers; parenting programs, and the evaluation of clinical services. Oh…and he loves playing football, riding his motorbike, learning Italian, and playing the violin.